REMARKS

Summary of Changes Made

The application was originally filed with claims 1-21. Claim 22 was previously added, and claims 8 and 13 were previously canceled. Accordingly, claims 1-7, 9-12, and 14-22 (20 claims) remain pending in the application. No new matter is added hereby.

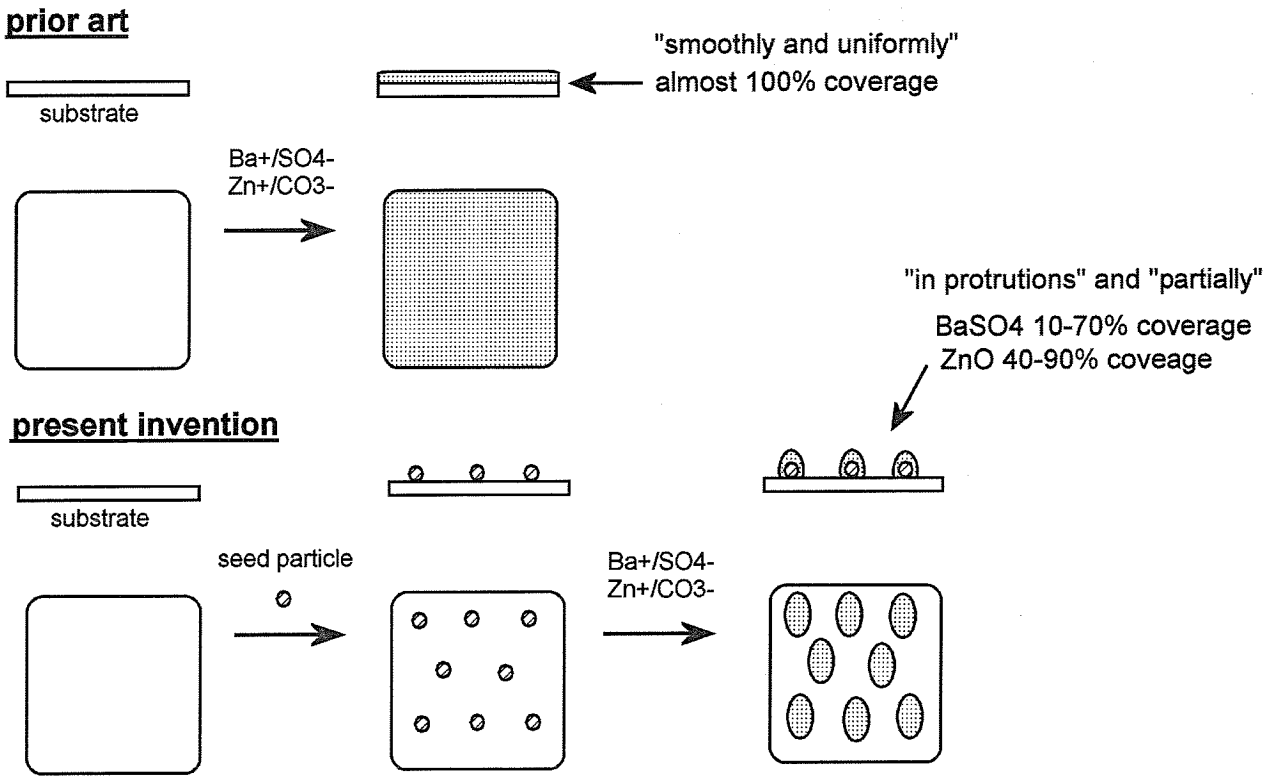
Claim rejections - 35 U.S.C. 102(b) – (Watanabe)

Claims 1, 6, 7 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Watanabe, et al., U.S. 4,603,047, ("Watanabe") . The Examiner asserts that the claimed invention is a composite powder comprising a flaky substrate powder and barium sulfate particles or zinc oxide particles that adhere, in protrusions, to the surface of the substrate powder. The Examiner contends that Watanabe teaches flaky substrates, such as mica, with a firmly adhering coating of barium sulfate that is used in cosmetics. The Examiner quotes col. 1, lines 49-60; col. 2, lines 3-8; col. 3, lines 46-49; and examples 7 and 12-14, and concludes that the indicated claims are anticipated by Watanabe.

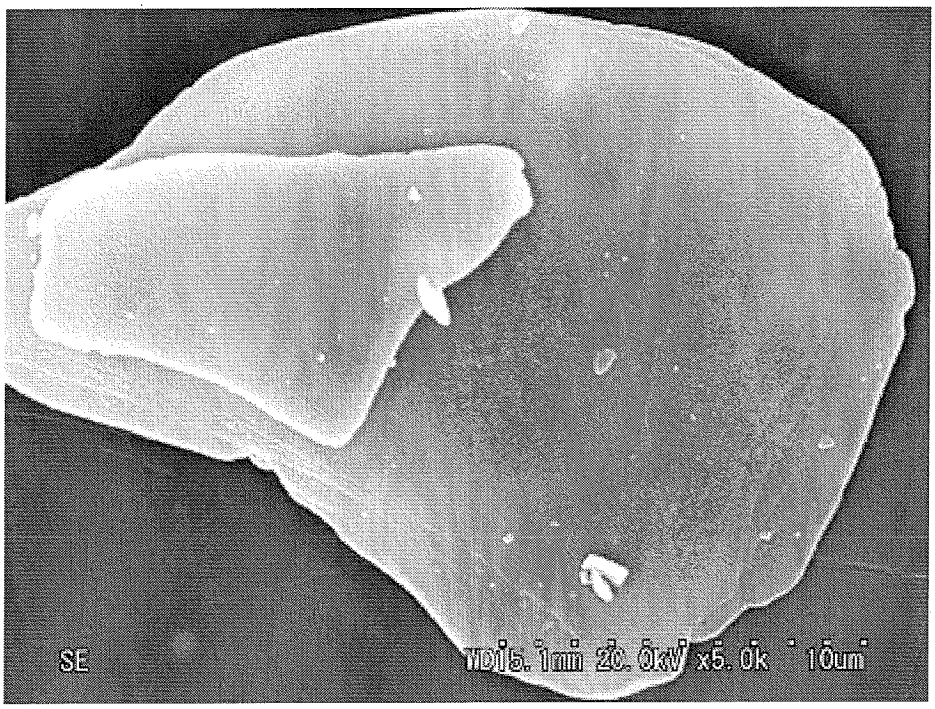
The cited references fail to disclose the composite powder of the present invention. In the composite powder of the present invention, barium sulfate particles and zinc oxide particles adhere to a flaky substrate powder in protrusions and only partially cover the surface of the substrate powder- barium sulfate coverage is 10–70%, zinc oxide coverage is 40–90%. In contrast, all of the composite powders disclosed in the cited documents include $BaSO_4$ or ZnO that adheres to the substrate powder smoothly and uniformly, i.e., essentially 100% coverage.

The inventive composite powder is produced in the presence of seed particles. The use of seed particles ensure that the $BaSO_4$ or ZnO particles adhere to the substrate both in protrusions and only partially cover the substrate. The seed particles act as the nuclei for the crystal growth of $BaSO_4$ or ZnO, and the crystals of $BaSO_4$ or ZnO begin to grow around the seed particle as instantly taught in paragraph [0074]. This is the commonly used meaning of the term "seed particles" in this context.

To the contrary, $BaSO_4$ or ZnO adhere smoothly and uniformly (essentially 100% coverage) without the use of seed particles, because there are not any nuclei for the crystal growth on the surface of substrate powder as schematically depicted below:

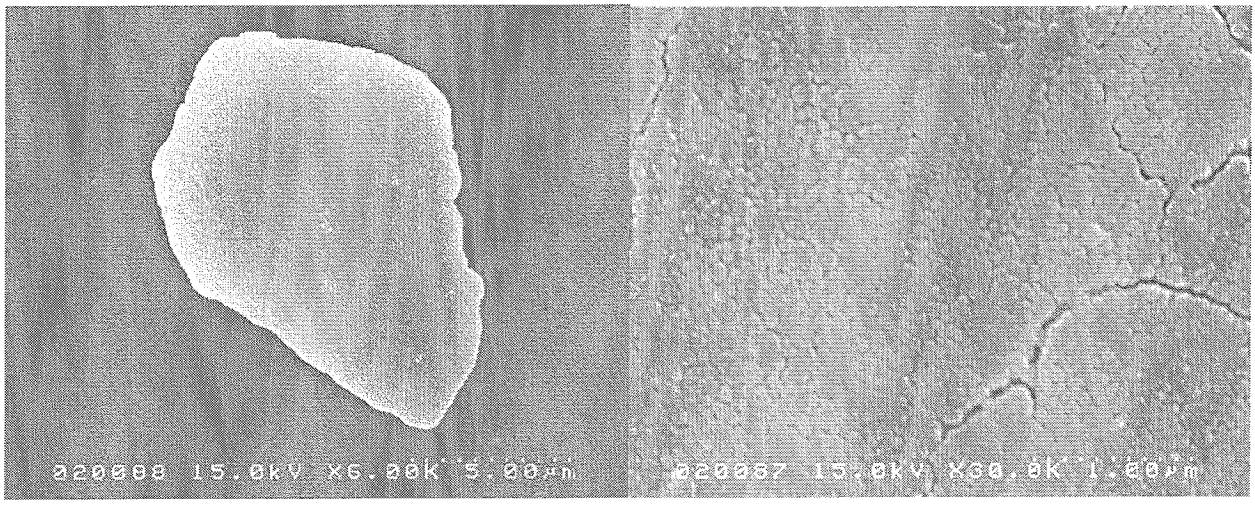


The Inventors herein previously attempted to produce $BaSO_4$-coated titanated mica composite powder without seed particles. A SEM picture of the $BaSO_4$ coating titanated mica composite powder without seed particles is shown below. It is evident that $BaSO_4$ adhered smoothly and uniformly, giving almost 100% coverage and similarly evident that a composite powder having only partial coverage of $BaSO_4$ or ZnO in protrusions cannot be obtained without seed particles.



In addition, Applicants previously obtained $BaSO_4$-coated titanated mica composite powder provided by Merck (assignee of all cited references). SEM pictures of the $BaSO_4$ coating titanated mica composite powder by Merck is shown as below. As shown below, the Merck composite powder features $BaSO_4$ or ZnO giving smooth, uniform and nearly complete coverage.

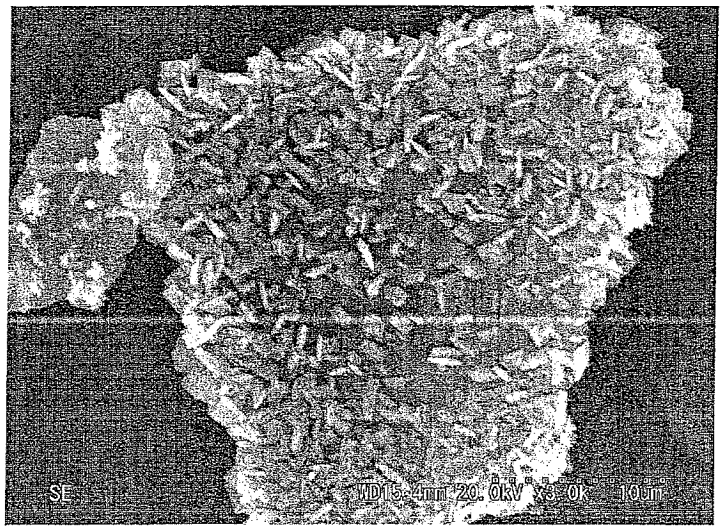
x6000 x30000



SEM pictures of the $BaSO_4$-coated titanated mica composite powder of the present invention is shown as below for your reference. (Example 1(A) and (B)).

Example 1

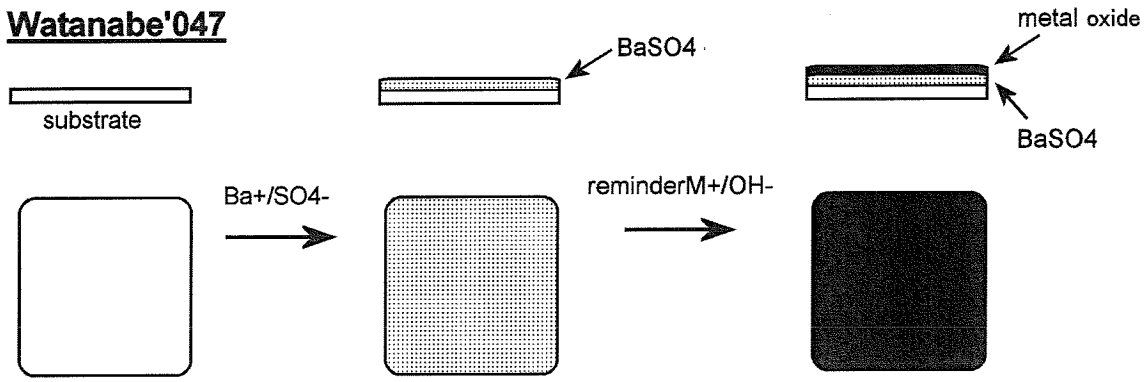
(A)



(B)

The Examiner alleges that Watanabe discloses that the composite powder was produced by using a metal oxide, which the Examiner equates to a seed particle. However, as Applicants stated in the previous amendment, Watanabe states that metal oxide coating is conducted after $BaSO_4$ coating. Thus, the metal oxide cannot act as a nucleation agent, i.e., "seed particle." In addition, metal oxide was precipitated on the composite powder by reaction of metal sulfate (metal ion remainder of formation of BaSO4) and alkali hydroxide. Since the metal oxide was

precipitated after $BaSO_4$ was added to the substrate powder, the composite powder of Watanabe features a coating of metal oxide on its outermost surface.



Watanabe further fails to disclose that the $BaSO_4$ or ZnO are adhered to the substrate particles in the form of protrusions. That is, the instances of $BaSO_4$ or ZnO on the surface of the instantly claimed substrate particles come as irregularly shaped islands, and not a continuous covering. The Examiner confuses this point on page 3, lines 9-12. The Examiner appears to require proof of the absence of protrusions on the mica of Watanabe. This is irrelevant. The claimed invention states that the coating of $BaSO_4$ or ZnO particles adheres in protrusions. It does not say that $BaSO_4$ or ZnO particles adhere "to" the substrate particles or "to" protrusions "on" the substrate particles. The phrase "in protrusions" means that the $BaSO_4$ or ZnO adheres

Such protrusions are a result of the use of seed particles which act as nuclei for crystallization of $BaSO_4$ or ZnO. Applicants note that Watanabe discloses that metal oxides can also be precipitated on the pigment, col. 2, lines 17-21. Such metal oxides cannot be considered seed particles because they do not act as crystallization nuclei. Indeed, the oxide particles of Watanabe are precipitated, that is, applied **onto** the pigment, **after** the pigment is coated onto the substrate particle.

The Examiner clearly glosses over this great distinction as evidenced in the Response to Arguments, at the top of page 4 of the Office Action: "[t]his is not persuasive because the metal oxides disclosed by Watanabe that are precipitated on [sic] are interpreted as seed particles which

can be used to coat a substrate and will inherently act as crystallization nuclei." Applicants respectfully submit that the Examiner's "interpretation" is incorrect.

Whether an oxide powder functions as a seed particle, i.e., a crystallization nucleus, indeed depends on whether it is present at a time when a crystallizable composition is added to a substrate. If the crystallizable composition (i.e., $BaSO_4$) has already been crystallized before the crystallization nucleus has been added, it cannot then be a nucleus for crystallization, as there is nothing further to crystallize. This is not a matter of interpretation. The metal oxides of Watanabe do not coat the substrate directly, but are added to coat the already applied

Any crystallization of $BaSO_4$ (pigment) that may occur in the synthesis of Watanabe's particles necessarily occurs before the oxide particles are added. Such oxide particles cannot then act as seed particles (as contended below by the Examiner in the rejection under Section 103 over Watanabe alone. Based on the foregoing, Applicants respectfully request withdrawal of the rejection.

Claim Rejections - 35 U.S.C. 102(b) – (Noguchi)

Claims 1, 6, 7 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi et al., U.S. 5,380,360, ("Noguchi"). The Examiner contends that Noguchi teaches flaky pigments with a barium sulfate coating where the barium sulfate grain size is from 0.5 to 2.0 microns and their use in cosmetics as extender pigments for face powder with excellent skin adhesiveness are known in the art, col. 1, lines 8-20. The Examiner further cites col. 2, lines 24-36 and 67-68; col. 3, lines 3-7 and 28-30; col. 11, lines 13-27 of Noguchi and concludes that the limitations of claims 1, 6-8 and 15 are anticipated by the disclosures thereof.

The Examiner's reasoning for this rejection is the same as for the Watanabe rejection, above. Applicants' response thereto is identical to that above. For the same reasons as presented in response to the rejection over Watanabe alone, Applicants respectfully request withdrawal of the rejection.

Claim Rejections - 35 U.S.C. 102(b) – (Noguchi '019)

Claims 1-3, 6, 12, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Noguchi et al., U.S. 4,956,019, ("Noguchi '019"). The Examiner contends that Noguchi '019

teaches a flaky colored pigment comprising fine flaky powder as base material and zinc oxide attached to the surface, col. 1, lines 6-10. Fine flaky particles that form the base material include mica-titanium oxide complexes and the amount of zinc oxide in the finished pigment is about 5 to 70% based on the total weight of the flaky color pigment, col. 1, lines 37-46. The Examiner contends that methods of making the flaky pigment are disclosed, col. 1, line 47 to col. 2, line 21. The Examiner further cites col. 1, lines 29-34; Example 8; col. 5, line 59 to col. 6, lines 7 and 26-45; and Example 10 and concludes that the limitations of claims 1-3, 6, 12, 13 and 15 are anticipated by the teachings of Noguchi '019.

The Examiner's reasoning for this rejection is the same as for the Watanabe rejection, above. Applicants' response thereto is identical to that above. For the same reasons as presented in response to the rejection over Watanabe alone, Applicants respectfully request withdrawal of the rejection.

Claim Rejections - 35 U.S.C. 103(a) – (Noguchi '019/ Noguchi '666)

Claims 1-7, 9-12, 14, and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi '019 in view of Noguchi et al., U.S. 6,086,666, ("Noguchi '666"). The Examiner admits from the previously mentioned teachings of Noguchi '019, that if fails to expressly teach the shape of the barium sulfate or the zinc oxide particles. Accordingly, the Examiner cites Noguchi '666 for its alleged teaching of coating a flaky (i.e. platelet shaped) powder with particles of zinc oxide and barium sulfate. col. 2, lines 8-11. The particles of barium sulfate have an average diameter of 0.1 to 2.0 microns and are essentially platelet shaped, whereas zinc oxide is needle-shaped with an average major-axis (i.e. long axis) diameter of 0.05 to 1.5 microns, col. 2, lines 18-28. Further details about the manufacturing process and the particles themselves are cited by the Examiner from col. 2, lines 30-46; col. 3, lines 3-16, 23-36, 48-51; claims 4 and 5, all of which lead the Examiner to conclude that it would have been obvious to make a flaky pigment with a mica-titanium oxide complex as the base material and zinc oxide particles as the coating, as suggested by Noguchi '019, combine it with the needle-shaped zinc oxide coating and platelet shaped barium sulfate coating of a flaky powder, as taught by Noguchi '666, and produce the instant invention. The Examiner cites motivations for the combination at col. 2, lines 52-59

of Noguchi '666. Applicants further acknowledge (but do not agree with) the Examiner's assertions with respect to each individual claim 1-7, 9-12, 14, and 15.

For all of their cited teachings, as noted above, neither Noguchi patent ('019 or '666) recites that the $BaSO_4$ or ZnO are adhered to the substrate particles in the form of protrusions, i.e., in a discontinuous manner. Such coatings in the Noguchi patents thus cover their respective substrate particles in essentially a continuous covering, which would amount to essentially the entire surface area of such particles. That is, the instances of $BaSO_4$ or ZnO on the surface of the instantly claimed substrate particles come as irregularly shaped islands, and not a continuous covering. Such protrusions are a result of the use of seed particles which act as nuclei for crystallization of $BaSO_4$ or ZnO, as amply discussed hereinabove. These differences render the instant claims non-obvious and patentable over the combination of the two cited Noguchi patents. Applicants respectfully request withdrawal of the rejection.

Claim Rejections - 35 U.S.C. 103(a) – (Watanabe)

Claims 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe. The teaching of Watanabe with respect to coating a substrate with barium sulfate is stated above. The Examiner admits that Watanabe does not expressly teach seed particles that are allowed to coexist in a slurry solution of the flaky substrate powder yet concludes that it would have been obvious to use the method of coating a substrate with barium sulfate particles, as taught by Watanabe, and modify the process by adding seed particles during the process of routine experimentation. The Examiner finds motivation to modify the reference in an alleged teaching of Watanabe that metal oxides can also be precipitated on the pigment, col. 2, lines 17-21. Seed particles, the Examiner alleges, include titanium oxide and zinc oxide, referring to instant paragraph [0084]. Since titanium dioxide, zinc oxide and aluminum oxide are disclosed by Watanabe, one with ordinary skill in the art would find it obvious to include them in the process of coating a substrate. In this case the titanium oxide and other metal oxides would allegedly act as the seed particles upon which the particle would start forming. Regarding each noted claim, the Examiner cites Watanabe at col. 1, lines 49-60; col. 2, lines 17-21; col. 3, lines 49-53, and Examples 7 and 12-14 as support for the allegation that the claims are obvious.

As discussed above, the oxide particles of Watanabe cannot be seed particles as instantly disclosed and claimed. Applicants note that Watanabe discloses metal oxides that are precipitated onto the pigment, col. 2, lines 17-21. As amply discussed hereinabove, such metal oxides cannot be considered seed particles because they do not act as crystallization nuclei. Indeed, the oxide particles of Watanabe are precipitated, that is, applied **onto** the pigment, **after** the pigment is coated onto the substrate particle. Any crystallization of $BaSO_4$ (pigment) that may occur in the synthesis of Watanabe's particles necessarily occurs before the oxide particles are added. Such oxide particles cannot then act as seed particles.

Based on the foregoing, the use of seed particles is not obvious from Watanabe because Watanabe fails to disclose anything that might reasonably act as a seed particle. Applicants respectfully request withdrawal of the rejection of claims 16, 18, and 19.

Claim Rejections - 35 U.S.C. 103(a) – (Watanabe/Noguchi)

Claims 20-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe in view of Noguchi. The teachings of Watanabe are set forth above. The Examiner admits that Watanabe fails to expressly teach a complexing agent. The teaching of Noguchi with respect to the process of making a fine granular barium sulfate-coated flaky pigment with a complexing agent is stated above with the Examiner's citation of col. 2, lines 24-36 of Noguchi. The Examiner concludes that it would have been obvious to use the method of coating a substrate with barium sulfate particles, as taught by Watanabe, and modify the process by adding seed particles during the process of routine experimentation, combine it with the process of making a fine granular barium sulfate-coated flaky pigment with a complexing agent, as taught by Noguchi, and produce the instant invention. One with ordinary skill in the art would do so because Noguchi teaches that a complexing agent is capable of forming a complex compound with the barium ion which leads to formation of particles on the surfaces of the fine flaky pigment grains, col. 2, lines 24-36.

As stated amply above, Watanabe fails to disclose a seed particle, which is a key limitation of claim 16, from which claims 20 and 21 depend. Noguchi also fails to disclose a seed particle. Hence, claims 20 and 21 fall outside the combined scope of Watanabe and

Noguchi. While asserting the patentability of claims 20 and 21, Applicants respectfully request the withdrawal of the rejection.

Claim rejections - 35 U.S.C. 102(b) – (Noguchi '019/Watanabe)

Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Noguchi '019 in view of Watanabe. While the teachings of Noguchi '019 are noted above, the Examiner admits that such teachings do not include that seed particles are allowed to coexist in a slurry solution of the flaky substrate powder. The Examiner contends that Watanabe teaches seed particles such as metal oxides that can also be precipitated on the pigment, col. 2, lines 17-21. The Examiner concludes that it would have been obvious to use the method of coating a substrate with zinc oxide particles, as taught by Noguchi '019, and combine it with the metal oxides that can be precipitated on the pigment, as taught by Noguchi '019, to produce the instant invention.

As discussed above, the oxide particles of Watanabe cannot act as seed particles as instantly disclosed and claimed. Applicants note that Watanabe discloses metal oxides that are precipitated on the pigment, col. 2, lines 17-21. Such metal oxides cannot be considered seed particles because they do not act as crystallization nuclei. Indeed, the oxide particles of Watanabe are precipitated, that is, applied **onto** the pigment, **after** the pigment is coated onto the substrate particle. Any crystallization of $BaSO_4$ (pigment) that may occur in the synthesis of Watanabe's particles necessarily occurs before the oxide particles are added. Such oxide particles cannot then act as seed particles.

Hence, the basis for the instant rejection fails. Applicants respectfully submit that claim 17 is patentable over Noguchi '019 in view of Watanabe and request withdrawal of the rejection.

Claim Rejections - Obviousness-Type Double Patenting – (Application No. 10/471,087)

Claims 1, 15 and 16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-5 and 7-11 of copending Application No. 10/471,087 (" '087"). Although the conflicting claims are not identical, they are not patentably distinct from each other because instant claims are directed to a composite powder with a flaky substrate powder and a method of producing the barium sulfate coated composite